

Maharashtra State Board
Class X Maths Algebra
Question Paper Set-3

Time : 2 Hours

Marks 40

Notes :

- (i) All questions are compulsory.
- (ii) Use of calculator is not allowed.
- (iii) Total marks are shown on the right side of the question.

Q. 1 (A) Solve any four of the following. 4

- (1) Write the set Q of rational numbers in the property form.
- (2) $|8| + |-3| = ?$
- (3) Find the value of $x^4 - x^3 + 5$ when $x = -1$
- (4) If x is the geometric mean of 16 and 9, find x .
- (5) Find the value of y in the equation $x + y = 12$, when $x = 5$
- (6) Write the dates of start and end of a financial year in our country.

(B) Solve any two of the following. 4

- (1) In some families in a colony the daily purchase of milk in litre is 1, 3, 2, 2, 4, 1, 2, 2, 1. Find the mean, median and mode of daily purchase of milk.
- (2) If $a : b = 7 : 2$, find the ratios (i) $b : a$ (ii) $\frac{a+b}{b}$.
- (3) Solve : $3x + y = 14$; $x - y = 2$

Q. 2 (A) Select the correct alternative and write it. 4

(1) What is the solution of the quadratic equation $2x^2 - 7x + 6 = 0$?

- (A) $-\frac{3}{2}, 2$ (B) $\frac{3}{2}, 2$ (C) $-2, \frac{3}{2}$ (D) $2, \frac{2}{3}$

(2) What is the sum of first n natural numbers ?

- (A) $\frac{n(n-1)}{2}$ (B) $\frac{n}{2}(n-2)$ (C) $\frac{n(n+1)}{2}$ (D) $\frac{n(n+2)}{2}$

- (3) If a share is at premium, then -
 (A) Market value > Face value
 (B) Market value = Face value
 (C) Market value < Face value
 (D) Market value \leq Face value
- (4) What is the degree of the determinant $\begin{vmatrix} a & b \\ c & d \end{vmatrix}$
 (A) 1 (B) 3 (C) 4 (D) 2

(B) Solve **any two** of the following. 4

- (1) If two coins are tossed simultaneously, find the probability of getting a head on both the coins.
- (2) Find the mean of the data given in the following table.

Class	0-20	20-40	40-60	60-80	80-100
Frequency	6	4	5	7	3

- (3) Form a quadratic equation whose roots are 4 and -12.

Q. 3 (A) Complete **any two** of the following activities. 4

- (1) The following table shows the blood-groups of employees in a bank.
 Event C is : ‘the blood-group of an employee is AB.’

Blood - group	A	B	AB	O
No. of employees	20	40	15	25

If an employee is chosen at random, what is the probability that his blood-group is AB ?

Fill in the following boxes and find the answer.

$n(S) = \square$

$n(C) = \square$

$P(C) = \square = \square$

- (2) The first term and the common difference of an A.P. is 10 and 5 respectively. Complete the following activity to find the sum of first 30 terms of the A. P.

$$S_n = \frac{n}{2} [\square + (n - 1) d]$$

$$\begin{aligned} \therefore S_{30} &= \frac{30}{2} [20 + (30 - 1) \times \square] \\ &= 15 [20 + \square] \\ &= 15 \times 165 \\ &= \square \end{aligned}$$

(3) Complete the following table to draw the graph of $3x - y = 2$

x	<input type="text"/>	-1
y	1	<input type="text"/>
(x, y)	<input type="text"/>	<input type="text"/>

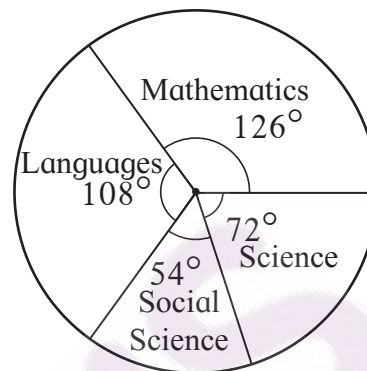
(B) Solve **any two** of the following. 4

- (1) Prasad purchased a share of face value Rs. 100 when its market price was Rs. 150. Company declared a dividend of 12% on the share. What was the rate of return on the investment Prasad made ?
- (2) The n^{th} term of the A. P. 3, 8, 13, 18, is 148. Find n
- (3) Solve the following simultaneous equations by Cramer's method.
 $x + y = 7, 2x - 3y = 9$

Q. 4 Solve **any three** of the following. 9

- (1) If α and β are the roots of the quadratic equation $x^2 - 4x - 6 = 0$, find the values of (i) $\alpha^2 + \beta^2$ (ii) $\alpha^3 + \beta^3$
- (2) The sum of third and seventh term of an A. P. is 6 and their product is 8. Find the first term and the common difference of the A. P.

- (3) A survey was conducted in Aadarsh Vidyalaya to know the inclination of students towards different subjects. The data obtained is presented by the adjacent pie diagram. If the total number of students was 500, answer the following questions.



- How many students show inclination towards mathematics ?
 - How many students are inclined towards social sciences ?
 - How many more students are inclined towards languages than science ?
- (4) The sum of a two digit number and the number obtained by reversing its digits is 121. Find the number if its units place digit is greater than the tens place digit by 7.

Q. 5 Solve **any one** of the following. 4

- The distance between Akola and Bhusawal is 168 km. An express train takes 1 hour less than a passenger train to cover the distance. Find the average speed of each train if the average speed of the express train is more by 14 km/hr than the speed of the passenger train.
- The following table is based on the marks of the first term examination of 10th class students. Show the information by a histogram. Also, draw a frequency polygon with the help of the histogram.

Class-mark of marks	325	375	425	475	525	575
No. of students	25	35	45	40	32	20

Q. 6 Solve **any one** of the following. 3

- A bag contains in all 50 balls. Some of them are white, some are blue and some are red. The number of white balls is 11 times the number

of blue balls. The number of red balls is less than the number of white balls. Also, the number of red balls is more than the number of blue balls. If one of the balls is selected at random from the bag, what is the probability that it is red ?

- (2) There are three dealers A, B and C in Maharashtra. Suppose, the trade of each of them in september 2018 was as shown in the following table. The rate of GST on each transaction was 5%.

Read the table and answer the questions below it.

Dealer	GST collected on the sale	GST paid at the time of purchase	ITC	Tax paid to the Govt.	Tax-balance with the Govt.
A	Rs. 5000	Rs. 6000	Rs. 5000	Rs. 0	Rs. 1000
B	Rs. 5000	Rs. 4000	Rs. 4000	Rs. 1000	Rs. 0
C	Rs. 5000	Rs. 5000	Rs. 5000	Rs. 0	Rs. 0

- (i) How much amount did the dealer A get by sale ?
(ii) For how much amount did the dealer B buy the articles ?
(iii) How much is the balance of CGST and SGST left with the government that was paid by A ?